

REMARKS

Claims 1-22 are pending in this application. In the Office Action dated December 15, 2004, the Examiner took the following action: (1) rejected claims 1-2, 4-7, 10, 13, 15 and 20-21 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,520,912 to Brooks *et al.*; (2) rejected claims 3, 8-9, 11-12, 14 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Brooks *et al.*; (3) rejected claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Brooks *et al.* as applied to claim 15 above and further in view of U.S. Patent No. 5,795,297 to Daigle; (4) rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Brooks *et al.* as applied to claim 15 above and further in view of U.S. Patent No. 6,370,413 to Alvarez *et al.*; (5) rejected claims 1-18 and 20-21 under 35 U.S.C. § 103(a) as being unpatentable over the combined teachings of Brooks *et al.* and U.S. Patent No. 5,293,326 to Arima *et al.*; and (6) rejected claims 19 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Brooks *et al.* and Arima *et al.* as applied to the claims above and further in view of Daigle or Alvarez *et al.*

The disclosed embodiments of the invention will now be discussed in comparison to the applied references. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the subject matter described in the applied references, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

The system and method disclosed in the present application is directed to allowing a user to easily and quickly set up an ultrasound imaging system by selecting an optimum one of a large number of combinations of acquisition parameters, display parameters and/or operating modes. As explained in the specification, in the prior art, the above-described settings for an imaging system are adjusted manually by a user while the user views a displayed image. As each of the settings is adjusted, the displayed image changes in a corresponding manner. It is fairly quick and easy to set up an ultrasound imaging system in this manner when a single setting or possibly two settings are being adjusted. For example, if only the resolution of the displayed image is being adjusted, there is little difficulty in changing in the resolution until the appearance of the displayed image is optimized. However, when a large number of settings must be

adjusted, it can require a great deal of time and specialized expertise to select the optimum combination of settings.

In the disclosed method and system, a gallery of images is displayed. Each of the images in the gallery is generated using a different combination of settings. The user selects the image having the best appearance, such as the image that best shows a particular anatomical feature. Selecting the image automatically selects the settings that were used to create the selected image, and the ultrasound imaging system is then set up using these settings. Using this approach, a particular one of a large number of combination of settings can be easily and quickly selected. In fact, the user need not even know what settings are being used to set up the ultrasound imaging system.

The primary reference cited in the Office Action is the patent to Brooks *et al.* The Brooks *et al.* patent discloses a method and system for automatically optimizing the resolution at which a diagnostic ultrasound image is displayed. As the Examiner may be aware, in conventional computer systems, such as those using a Microsoft® Windows® operating system, changing the resolution of the display changes the size of the image that is displayed. This can be observed by clicking “Start,” “Settings,” “Control Panel,” “Display,” and “Settings.” The Examiner will note the presence of a box labeled “Screen Area” to allow an adjustment of the number of pixels in the display. When a large number of pixels, *i.e.*, a high resolution, is selected, the size of the image is relatively small. When a smaller number of pixels, *i.e.*, a low resolution, is selected, the size of the image is relatively large. The system disclosed in the Brooks *et al.* patent describes the size of the displayed image varying according to the displayed resolution in the same manner.

The system disclosed in the Brooks *et al.* patent includes a display resolution optimizer 240 (Figure 2) that automatically analyzes data corresponding to an image to be displayed to determine the optimum display resolution. The image is then displayed at that resolution. The display resolution optimizer 240 operates in accordance with the flowchart shown in Figure 3. The percentage of the display occupied by an image at a current resolution is calculated at step 320 and compared to a previously calculated percentage at 325. As long as the calculated percentage for the current resolution is greater than the previously calculated percentage, the current resolution is saved. A new current resolution is then obtained, and the

percentage of display occupied by the image is then re-calculated at step 320 and compared to the previously calculated percentage at 345. This process is repeated until a determination is made at 355 that the percentage of display occupied by the image at a current resolution is greater than 100 percent. In such case, the previously-saved resolution, *i.e.*, the resolution that resulted in less than 100 percent of the display being occupied, is used to display the image.

The Brooks *et al.* system thus somewhat mimics the operation conventionally performed by a user to adjust the resolution of a displayed image, such as explained above in the Windows® operating system. In other words, each resolution is sequentially selected, and the size of the image at the corresponding resolution is examined. When a desired image size is obtained, the resolution used to provide the image is subsequently used. However, in the Brooks *et al.* system, the image size is selected by calculation rather than by viewing a displayed image.

The Office Action indicates that Brooks *et al.* teach “a thumbnail or reduced-sized gallery of ultrasound images 730 on display 700, each of which *may be* obtained using a different modality setting.” (Emphasis added). While it *may be* possible to obtain each of the images using a different modality setting, the Brooks *et al.* patent does not provide any teaching or a suggestion that such as the case. In fact, Brooks *et al.* teach that the displayed images are *not* obtained using different modality settings, *i.e.* different resolutions. Specifically, the patent states in column 4, lines 23-25 “[i]n this preferred embodiment, each of the displayed images has the same size: 320 by 240.” A patent is a reference for what it actually teaches or suggests; it is not a reference for what it might teach or might suggest.

Nor is it the case that selecting an image automatically selects a resolution that was used to display that image. Instead, the resolution that is to be used is not determined until *after* an image has been selected for analysis. [See, column 4, lines 25-31].

Turning, now, to the claims, claim 1 specifies a method of setting-up an ultrasound imaging system in which the ultrasound imaging system is used to display a gallery of ultrasound images each of which is obtained using a different setting for the ultrasound imaging system. As explained above, Brooks *et al.* teach just the opposite, *i.e.* that all of the images displayed in Figures 4A and 4B are obtained using the same resolution. Claim 1 further specifies that at least one of the of the displayed ultrasound images is selected, and that the ultrasound imaging system is then set up using the setting for the at least one selected ultrasound image.

Again, the Brooks *et al.* patent does not teach this subject matter. Instead, in the Brooks *et al.* system, the ultrasound imaging system is not set up, *i.e.*, its resolution selected, until *after* an image is selected and the selected image is then analyzed. Nor would it be possible for the selection of one of the displayed images to automatically select a corresponding resolution since, as demonstrated above, Brooks *et al.* teach that all of the images are displayed with the same resolution. Thus, selecting any of the images would result in selecting the same resolution regardless of which image was selected. The Brooks *et al.* patent thus clearly fails to anticipate claim 1.

Claim 1 has also been rejected as being obvious over the patent to Brooks *et al.* in view of the patent to Arima *et al.* However, the Arima *et al.* patent does not provide the teachings that are missing from the teachings of the Brooks *et al.* patent. Instead, the Arima *et al.* patent simply discloses storing data corresponding to different images with data specifying measurement conditions used to obtain the image data. There is no suggestion in the Arima *et al.* patent that the stored data corresponding to each of the images are obtained using different settings for the ultrasound measurement system. Instead, for all the Arima *et al.* patent teaches, all or most of the displayed images could have been obtained using the same measurement settings. Furthermore, the Examiner has not explained how the teachings of the Brooks *et al.* patent would be combined with the teachings of the Arima *et al.* patent or why one skilled in the art would be motivated to combine their respective teachings.

Claim 15, the only other independent claim in the application, also patentably distinguishes over the Brooks *et al.* patent, both alone in combination with the patent to Arima *et al.* Claim 15 specifies a diagnostic ultrasound imaging system which includes, *inter alia*, a controller that is “operable to cause a gallery of ultrasound images obtained using different settings to be shown on the video display.” As explained above, neither the patent to Brooks *et al.* nor the patent to Arima *et al.* discloses that the galleries of displayed images are obtained using different settings. Claim 15 further states that the controller responds to the selection of one of the ultrasound images “to operate at least one of the signal processor and the image processor using the setting that was used to obtain the selected ultrasound image.” As explained above with reference to Figure 1, the cited references taken either alone or in combination do not disclose this concept.

All of the other claims in the application are dependent on either claim 1 or claim 15. Therefore, these claims patentably distinguish over the cited references because of their dependency on patentable independent claims and because of the additional limitations added by those claims. For example, claims 11 and 18 specify a method and system in which ultrasound images in a gallery are obtained based on settings used to obtain a previously selected image. Certainly the prior art does not disclose or suggests this type of iterative process for setting up an ultrasound imaging machine.

All of the claims in the application, namely claims 1-22, are clearly allowable. Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,

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